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Total Number of Pages in This Submission: 10

Application Number	10/049,650
Filing Date	05/02/2002
First Named Inventor	Ronald Kates
Art Unit	2121
Examiner Name	Hirl, Joseph P.
Attorney Docket Number	GRUNP35

ENCLOSURES *(Check all that apply)*

- [✔] Fee Transmittal Form
- [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [✔] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance communication to Technology Center (TC)
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
- [ ] Proprietary Information
- [ ] Status Letter
- [✔] Other Enclosure(s) (please identify below):

Comments on Statement of Reasons for Allowance

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	IP Strategies Thomas M. Champagne
Signature	
Date	08/26/2005

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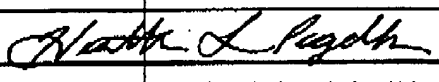
Signature		Date	08/26/2005

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
10/049,650	05/02/2002	Ronald Kates	GRUNP35	7878

Invention	Examiner	Art Unit
Method for Training a Neural Network	Hirl, Joseph P.	2121

Comments on Statement of Reasons for Allowance

Mail Stop ISSUE FEE
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Sir:

In response to the examiner's Statement of Reasons for Allowance included with the Notice of Allowability mailed May 26, 2005, please consider the following comments:

The Examiner's Statement of Reasons

The following is the examiner's Statement of Reasons for Allowance:

The cited prior art taken alone or in combination fails to teach the claims invention of a method for training a neural network, to include pruning, to identify a patient risk function based on patient data and stipulated in the specification in paragraph 5.3 based on the survival function S (t) wherein the task of the neural network is to model the curve of the risk function $\lambda(t)$ in the same way as a series expansion characterized by:

$$\lambda_0 * \exp[\Sigma_0 B_0(t) * A_0]$$

where :

λ_0 is a scaling factor,

A_0 represents parameters that are the response signals of the neurons N_0 of the output layer of the neural network, and

B_0 (t) represents a set of base functions of the series expansion that enable good approximation to the actual curve of the risk function.

The closest prior art (Mehrotra, Elements of Artificial Neural Networks, MIT Press, 1997) teaches training and pruning of neural networks. Mehrotra does not teach training a neural network to represent a series expansion wherein data representing such series expansion is formulated from patient data in an exponential summation format to include pruning represented by the singular act of neuron removal.

Comments

The allowed independent claims are claims 12 and 24. Allowed claim 12 reads as follows:

12. A method for training a neural network in order to identify a patient risk function such that the structure of the neural network is simplified, wherein the neural network includes

- an input layer having a plurality of input neurons that receive input data,
- at least one intermediate layer having a plurality of intermediate neurons,
- an output layer having a plurality of output neurons that provide output signals, wherein the output signals define the patient risk function following a first occurrence of a disease on the basis of given training data records including objectifiable and metrologically captured data relating to the medical condition of a patient, and

- a multiplicity of synapses, wherein each said synapse interconnects a first neuron of a first layer with a second neuron of a second layer, defining a data sending and processing direction from the input layer toward the output layer,

wherein the method comprises:

identifying and eliminating synapses of the multiplicity of synapses that have an influence on the curve of the risk function that is less than a predetermined significance, including

determining pre-change output signals of the neural network,

selecting first and second sending neurons that are connected to the same receiving neuron by respective first and second synapses,

assuming a correlation of response signals from said first and second sending neurons to the same receiving neuron,

interrupting the first synapse and adapting in its place the weight of the second synapse,

determining post-change output signals of the neural network,

comparing the post-change output signals with the pre-change output signals, and

eliminating the first synapse if the comparison result does not exceed a predetermined level.

Thus, claim 12 does not recite training a neural network to represent a series expansion wherein data representing such series expansion is formulated from patient data in an exponential summation format to include pruning represented by the singular

act of neuron removal. Specifically, claim 12 does not recite a patient risk function based on patient data based on the survival function S (t) wherein the task of the neural network is to model the curve of the risk function $\lambda(t)$ in the same way as a series expansion characterized by $\lambda_0 \cdot \exp[\Sigma_0 B_0(t) \cdot A_0]$. Limitations of this type are not recited or suggested in claim 12 or in the dependent claims. Further, limitations of this type were not discussed in any of the examiner's actions, nor in any of the responses thereto, nor in any of the telephone interviews conducted between the undersigned and the examiner. It is respectfully submitted that no limitations of this type should be imputed to the claims based on the examiner's statement of reasons for allowance, and the claims should be given the broadest interpretation based on the literal meaning of the claims in view of the prosecution history prior to allowance.

Allowed claim 24 reads as follows:

24. A method for training a neural network in order to identify a patient risk function such that the structure of the neural network is simplified, wherein the neural network includes

- an input layer having a plurality of input neurons that receive input data,
- at least one intermediate layer having a plurality of intermediate neurons,
- an output layer having a plurality of output neurons that provide output signals, wherein the output signals define the patient risk function following a first occurrence of a disease on the basis of given training data records including objectifiable and metrologically captured data relating to the medical condition of a patient, and

- a multiplicity of synapses, wherein each said synapse interconnects a first neuron of a first layer with a second neuron of a second layer, defining a data sending and processing direction from the input layer toward the output layer,

wherein the method comprises:

identifying and eliminating synapses of the multiplicity of synapses that have an influence on the curve of the risk function that is less than a predetermined significance, including

determining pre-change output signals of the neural network,

selecting a synapse,

assuming that the selected synapse does not have a significant influence on the curve of the risk function,

interrupting the selected synapse,

determining post-change output signals of the neural network,

comparing the post-change output signals with the pre-change output signals, and

eliminating the selected synapse if the comparison result does not exceed a predetermined level.

Thus, claim 24 does not recite training a neural network to represent a series expansion wherein data representing such series expansion is formulated from patient data in an exponential summation format to include pruning represented by the singular act of neuron removal. Specifically, claim 24 does not recite a patient risk function based on patient data based on the survival function S (t) wherein the task of the neural network

is to model the curve of the risk function $\lambda(t)$ in the same way as a series expansion characterized by $\lambda_0 \cdot \exp[\Sigma_0 B_0(t) \cdot A_0]$. Limitations of this type are not recited or suggested in claim 24 or in the dependent claims. Further, limitations of this type were not discussed in any of the examiner's actions, nor in any of the responses thereto, nor in any of the telephone interviews conducted between the undersigned and the examiner. It is respectfully submitted that no limitations of this type should be imputed to the claims based on the examiner's statement of reasons for allowance, and the claims should be given the broadest interpretation based on the literal meaning of the claims in view of the prosecution history prior to allowance.

Respectfully submitted,

July 28, 2005
Date

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